

Precision Guided Cultivation in Lettuce and Celery

*Christina A. George Graduate Student Researcher, University of California Davis
John S. Rachuy Staff Research Associate III Cooperative Extension UC Davis
Steven A. Fennimore Extension Vegetable Weed Specialist UC Davis
1636 East Alisal St. Salinas, CA 93905; 831-755-2896; safennimore@ucdavis.edu*

Abstract

In 2007, three trials were conducted to evaluate the efficiency of the Robocrop vision-guided system with various cultivation tools in conjunction with post-emergent and pre-emergent herbicides. The lettuce trials were arranged as a split plot with pronamide as the main plot and cultivator tool or directed herbicide as the subplot. Half of the main plots were treated with a pre-emergent application of pronamide at 1.2 ai/Ac in 40 GPA, the other half of the plots received no pronamide. The cultivator tools included in the comparison were: sweep knives, bezzers, and coulters with sweep knives. The post-emergent directed herbicides included Scythe 4.2EC and Shark 2E. Scythe was applied at 3 and 6% v/v in the first trial and second trials respectively, while Shark was applied at 0.032 lb/ai/Ac in both trials. Data gathered were the number of marketable heads, weed densities and hand-weeding times. In the celery trial, the Robocrop was used to guide an application of Scythe herbicide at 3% v/v in a volume of 100 GPA directed between the plant lines and to guide a close cultivation with sweep knives. Data gathered in the celery study were crop injury, and yield, weed densities and hand weeding times. The first lettuce trial showed that the pronamide application significantly reduced hand weeding times, produced larger marketable heads, and increased yield. The bezzers gave the highest yield when the pronamide was applied. The best weed control in both trials was found in the plots that used knives, coulters with knives, and Shark. However Shark caused crop injury and lowered yields. In the second trial, the bezzers and the Scythe treatments produced the largest heads; Shark again injured the crop. In the celery trial, the knives and directed Scythe spray significantly reduced weeds, and no crop injury was observed. The Scythe treatment produced the greatest number, weight, and size of marketable celery stalks.